

REMARKS/ARGUMENTS

By the foregoing, claims 1-8; 10-22; and 24-28 are pending. Claims 1, 15, 24-28 are amended, claims 9 and 23 are cancelled.

In view of the foregoing amendments and the following remarks, reconsideration of the present patent application is respectfully requested. Claims 1 and 15 have been amended to more distinctly point out the subject matter of the claimed invention. All of the amendments are supported by the specification and figures of the present invention as originally filed, no new matter added.

With regard to the amendment to paragraph [0024], please refer to Fig. 5. The original English description, “the other end of the composite plate 14 is hanging freely”, is unclear due to an obscure translation from Chinese to English. Accordingly, Applicant respectfully amends the sentence to read “the other end of the composite plate 14 is a cantilever free end” in order to further illustrate the present invention.

Rejection under 35 U.S.C. §103(a)

Claims 1-8 and 15-19 were rejected in the Action under 35 U.S.C. 103(a) as unpatentable over Ogle (US 6,466,716 B1), claims 9-11 and 23-25 were rejected under 35 U.S.C. 103(a) as unpatentable over Ogle (US 6,466,716 B1) in view of

Skull et al (US 2004/0218863A1); claims 12-13 and 26-27 were rejected under 35 U.S.C. 103(a) as unpatentable over Ogle (US 6,466,716 B1) in view of Bohnert et al (US 6,563,970 B1), claims 14 and 28 were rejected under 35 U.S.C. 103(a) as unpatentable over Ogle (US 6,466,716 B1) in view of Hu et al (US 6,366,721 B1), and claims 20-22 were rejected under 35 U.S.C. 103(a) as unpatentable over Ogle (US 6,466,716 B1) in view of Reese et al (US 5,993,934).

Claims 1 and 15 have been amended to further clarify the features of the present invention. Reconsideration and removal of the grounds for rejections are respectfully requested.

Independent claims 1 and 15 were rejected as unpatentable over Ogle. The applicant respectfully disagrees. As currently claimed in claim 1, the present invention provides a device for temperature compensation, comprising: a composite plate comprising plural fiber reinforced laminae, each of which has a designed fiber orientation, and having a specific temperature-dependent characteristic in a direction, for compensating an optical component positioned thereon and having a temperature-dependent deformation, wherein the specific temperature-dependent characteristic is determined by the designed fiber orientation of the plural fiber laminae, and the composite plate has one end fixed in a compartment and the other end being a cantilever free end, and the compartment is sealed to isolate the influence of external temperature fluctuations. As currently claimed in amended

claim 15, the present invention provides a method for temperature compensation, comprising the steps of: providing a composite plate comprising plural fiber laminae, each of which has a designed fiber orientation, and having a specific temperature-dependent characteristic in a direction; bonding an optical component having a temperature-dependent deformation along the direction on the composite plate so as to compensate the deformation through the specific temperature-dependent characteristic; and fixing the composite plate in a compartment at one end thereof, wherein the other end of the composite plate is a cantilever free end, the specific temperature-dependent characteristic is determined by the designed fiber orientations of the fiber laminae, and the compartment is sealed to isolate the influence of external temperature fluctuations. It is to be emphasized that referring to Fig. 5 and the paragraph [0024] of the present invention, one side of the composite plate 14 is fixed in a tube 22 using sealing plastic 20, and the other end of the composite plate 14 is a cantilever free end.

It is to be noted that in Ogle, the polymeric composite materials are used for fabricating the device to resist the temperature-induced change in Bragg grating wavelength. The device of Ogle's patent depends on the negative coefficient of thermal expansion (CTE) of the reinforcing fibers in the composite to get the contraction in the device, thereby compensating the wavelength shift. In Ogle, Kevlar fiber is used, wherein the Kevlar fiber has a negative CTE ($-4 \times 10^{-6} / ^\circ\text{C}$)

similar to the order ($-8 \times 10^{-6} / ^\circ\text{C}$) required for compensating the Bragg wavelength shift. Hence, it is known to one skilled in the art that Ogle's method and device work if the reinforcing fiber indeed has a negative CTE.

However, the thermal compensation device of the present invention does not depend on the existence of a negative CTE. Moreover, the present invention is based on the anisotropic thermal expansion properties of a composite lamina. Accordingly, the underlying principles of Ogle's patent and the present invention are apparently different.

Furthermore, the Examiner admits on Page 4 of the Office Action that Ogle's patent does not explicitly teach the composite material fixed in a compartment at one end and having a cantilever free end, wherein the compartment is sealed, and thermally insulating material is used all around the compartment to alleviate heat conduction.

Furthermore, in Skull (US 2004/0218863A1), it is to be noted that the compartment 4 in Fig. 1 is composed of three different sections respectively having different coefficients of thermal expansion (CTE). In Skull's thermal compensation device, the three sections are welded or glued to form the compartment 4, and the ends of the optical fiber are fixed to different sections; however, the thermal compensation device of the present invention as a whole is fixed into an additional compartment at one end and the other end is a cantilever free end. It is to be

clarified that it is the composite plate not the compartment which has a cantilever free end in the present invention.

The connection relationship between the compartment and the thermal compensation device of the present invention is not shown or suggested by Ogle and Skull.

Based on the above amendments and remarks, the present invention has many features never shown, taught or suggested in Ogle and Skull. Further to the above arguments and amendments, the present invention cannot be achieved by one skilled in the art from the teachings of Miller and Skull.

Accordingly, claims 1 and 15 of the present invention are believed patentable over Miller and Skull. Since claims 2-8 and 10-14 are all dependent on claim 1 and claims 16-22 and 24-28 are all dependent on claim 15, dependent claims 2-8, 10-14, 16-22 and 24-28 are all also believed to be allowable as being dependent on claims 1 and 15.

Based on the above amendments and remarks, the withdrawal of the rejections under 35 U.S.C. § 103 and the allowance of claims 1-8; 10-22; and 24-28 are respectfully requested.

Applicant: Shin et al.
Application No.: 10/712,837

Conclusion

If the Examiner believes that any additional minor formal matters need to be addressed in order to place this application in condition for allowance, or that a telephone interview will help to materially advance the prosecution of this application, the Examiner is invited to contact the undersigned by telephone at the Examiner's convenience.

Respectfully submitted,

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